



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,270	12/23/2003	Levinus Pieter Bakker	081468-0307112	4454
909	7590	05/09/2006	EXAMINER	
PILLSBURY WINTHROP SHAW PITTMAN, LLP			NGUYEN, HUNG	
P.O. BOX 10500			ART UNIT	
MCLEAN, VA 22102			PAPER NUMBER	
			2851	

DATE MAILED: 05/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

Office Action Summary	Application No. 10/743,270	Applicant(s) BAKKER, LEVINUS PIETER	
	Examiner Hung Henry V. Nguyen	Art Unit 2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/13/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Prosecution

1. Applicant's arguments along with pre-appeal brief request for review filed April 12, 2006 have been carefully reviewed. As a result of the pre-appeal conference, the finality of the previous office action is withdrawn. The Examiner has changed the arts and/or advanced new arguments.

Claim Objections

3. Claims 28-29 are objected to because of the following informalities: Claims 28 and 29 are objected to as being improper dependent claims. The claims are drawn to a device manufactured by the apparatus or a method of claims 1 and 21 respectively. It is conceivable that the device (for example, in this case, it is the substrate/or wafer) can be made by another apparatus and/or method other than the apparatus and method of claims 1 and 21. The claims do not further limit claims 1 and 21 as required by 35 USC 112, 4th paragraph. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who

Art Unit: 2851

has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 1-7, 9-22, 24, and 26-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Koster et al (U.S.Pat. 6,614,505).

With respect to claims 1, 19, 21 and 27-29, Koster et al discloses a lithographic projection apparatus and corresponding method comprising all structures set forth in the instant claims such as: a radiation system (LA) and an illumination system (IL) for supplying a beam of radiation (PB); a support structure (MT) that supports a patterning device (MA) the patterning structure configured to pattern the beam of radiation according to a desired pattern; a substrate support (WT) that supports a substrate (W); a projection system (PL) that projects the patterned beam onto a target portion of the substrate; an electrode (133; 135) and a voltage source (134; 136) that applies an electric field between the radiation source (LA) and the electrode to generate a discharge between the radiation source and the electrode (see figure 2).

As to claim 2, Koster et al disclose the electrode (133; 135) being positioned in the beam of radiation (PB).

As to claim 3, Koster et al disclose a contaminant barrier disposed downstream, relative to the direction of propagation of the beam of radiation, of the radiation source.

Art Unit: 2851

With respect to claims 4 and 24, the electrode (133; 135) is a contaminant barrier (130, 137) disposed downstream, relative to the direction of propagation of the beam of radiation, of the radiation source.

As to claims 5-6, Koster discloses that the electrode is a hollow cathode (see figure 2).

With respect to claims 7, and 22, it is disclosed that the voltage source is arranged to generate a DC field (see col.7, lines 42-50).

As to claim 9, Koster discloses a magnetic field generator is provided to apply an axial magnetic field between the radiation source (LA) and the electrode (133; 135).

With respect to claims 10 and 26, Koster disclose a gas (15) is provided in a region traversed by the beam or radiation.

As to claims 11-13, Koster discloses that the gas comprises an extreme-ultra violet transparent gas/inert gas/or noble gas and a gas supply (14) is constructed and arranged to provided the gas in the region traversed by the projection beam.

As to claim 14, Koster discloses an exhaust system (16) positioned upstream, relative to the direction of propagation of the beam of radiation, of the gas supply unit (14) to remove the gas from the region traversed by the beam of radiation, and to create a gas flow being substantially directed in an opposite direction to a direction of propagation of contaminant particles.

As to claims 15-18, Koster et al discloses the lithographic projection system comprises a laser-produced, or discharge, plasma radiation source having wavelength of about 157 nm or having a wavelength in the range of 5-20 nm (see col.5, lines 21-26).

Art Unit: 2851

As to claim 25, Koster et al discloses the electric field between the radiation source and the electrode having a voltage difference up to about 1000 V (see col. 7, lines 45-50).

6. Claims 1-4, 7-8, 15-25 and 27-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Moors et al (U.S.Pat. 6,781,673).

With respect to claims 1-4, 19-22, 24, 27-29, Moors et al discloses a lithographic projection apparatus, device manufacturing method and method for debris suppression, comprising all structures set forth in the instant claims such as: a radiation system (LA) and an illumination system (IL) for supplying a beam of radiation (PB); a support structure (MT) that supports a patterning device (MA) the patterning structure configured to pattern the beam of radiation according to a desired pattern; a substrate support (WT) that supports a substrate (W); a projection system (PL) that projects the patterned beam onto a target portion of the substrate; an electrode (9; 11; 12; 150) and a voltage source (see figure 2) that applies an electric field between the radiation source (LA) and the electrode to generate a discharge between the radiation source and the electrode. Moor et al further discloses the electrode (9; 11; 12; 150) being positioned in the beam of radiation (PB) and a contaminant barrier (see col.9, lines 22-30) disposed downstream, relative to the direction of propagation of the beam of radiation, of the radiation source (see figure 2; 13).

With respect to claims 7, and 22, it is disclosed that the voltage source is arranged to generate a DC field (see col.7, lines 42-50).

Art Unit: 2851

As to claims 8 and 23, Moor et al disclose the voltage source being arranged to generate a square wave modulated electric field that is synchronized with the radiation source (see col.9, lines 29-30).

As to claim 9, Moors et al discloses a magnetic field generator is provided to apply an axial magnetic field between the radiation source (LA) and the electrode (see figure 2).

As to claims 15-18, Moor et al discloses the lithographic projection system comprises a laser-produced, or discharge, plasma radiation source having wavelength of about 157 nm or having a wavelength in the range of 5-20 nm (see col.5, lines 55-60).

As to claim 25, Moor et al discloses the electric field between the radiation source and the electrode having a voltage difference up to about 1000 V (see col. 8, lines 36-41).

7. Claims 19-20, and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Silfvast et al (U.S.Pat. 6,232,613).

With respect to claims 19-20 and 27, Silfvast et al discloses a radiation system and a corresponding method comprising all of the limitations of the instant claims including: a radiation source (EUV); an electrode (10, 30) and a voltage source (V) that applies an electric field between the radiation source and the electrode and generates a discharge between the radiation source and the electrode to capture contaminant particles from the radiation source.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

Art Unit: 2851

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-7, 15-22, 24, 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogushi et al (U.S.Pat. 6,867,843) in view of Silfvast et al (U.S.Pat. 6,232,613).

With respect to claims 1-7, 15-22, 24, 27-29, Ogushi et al discloses a lithographic projection apparatus and corresponding method comprising substantially all of the limitations of the instant claims such as: a radiation system (800) having a radiation source of a wavelength of about 13 nm (see col.5, lines 65-66); an illumination system (see figure 1) for supplying a beam of radiation; a support structure (824) for supporting a patterning device (820), the patterning device configured to pattern the beam of radiation according to a desired pattern; a substrate support (854) for supporting a substrate; a projection system (840) for projecting the pattern formed on the patterning device onto a target portion of the substrate (850) and a debris removing system (100) having an attracting surface (130) placed between the radiation source and the mirror for capturing contaminant particles from the radiation source. Osughi does not expressly disclose the attracting surface being an electrode and a voltage source applied a discharge/or an electric field between the radiation source and the electrode for capturing the particles from the radiation source. However, Ogushi suggests that a discharging type such as hollow-cathode triggered Z-pinch type and the like may be applied to the debris removing system (see col.11, lines 1-3). Furthermore, as discussed above, Silfvast et al discloses a debris blocker for used in a lithography system, the debris blocker has an electrode (10, 30) and a voltage source (V) for generating a discharge and capturing contaminant particles from a radiation source. In view of such teachings, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Ogushi et al and

Art Unit: 2851

Silfvast et al to obtain the invention as specified in the above mentioned claims of the present invention. It would have been obvious to a skilled artisan to apply a voltage to the attracting plate (130) of Ogushi et al as suggested by Silfvast for the purpose of generating a discharge between the radiation source and the attracting plate for capturing the particle from the radiation source whereby the optical elements of the lithographic projection exposure apparatus can be prevented from being contaminated and thus improving the quality of the images.

Response to Applicant's Arguments

10. Applicant's arguments filed 4/12/06 have been carefully reviewed but have been traversed in view of the rejections set forth above.

With respect to claims 19-20, in response to applicant's arguments that Silfvast et al does not teach an electric field between the radiation source and the electrode; the Examiner respectfully disagrees with the applicant since Silfvast clearly teaches "the present invention is to provide a trap for collecting optic harming debris that are ejected from an operating capillary discharge lamp" (see col.2, lines 60-63). Based on that teachings, the electric field must be generated somewhere between the discharge lamp and the electrode to capture the harming debris from the discharge lamp/radiation source, as claimed (in the broadest sense).

With respect to claims 28 and 29, the claims recite a device made by the apparatus and the method of claim 1 and 21, respectively. The applicant is again reminded that it is conceivable that the claimed device can be made by another apparatus/and method other than the apparatus and method of claims 1 and 21. Clearly, the device (for instance: the photosensitive substrate in this case) can made by another apparatus/method such as the apparatus/method of

Art Unit: 2851

Silfvast et al. It has been held that the patentability of a device /product does not depend on its method of production. **Once a product appearing to be substantially identical is found and a 35 U.S.C. 102/103 rejection made, the burden shifts to the applicant to show an unobvious difference (see *In re Mareosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983).**

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Henry V. Nguyen whose telephone number is 571-272-2124. The examiner can normally be reached on Monday-Friday (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Hung Henry V Nguyen
Primary Examiner
Art Unit 2851